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EXAMINER

AN, SHAWN S

| ART UNIT | PAPER NUMBER |
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2613

DATE MAILED: 08/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/890,230

Applicant(s)

KUHN, PETER M.

Examiner

Shawn S. An

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-92 is/are pending in the application.
- 4a) Of the above claim(s) 53-92 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-52 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>7/27/01</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Response to Remarks

1. Applicants' election without traverse of the species II corresponding to Fig. 6, including claims 1-52 as filed on 4/15/05 has been acknowledged. Therefore, the non-elected claims 53-92 are considered withdrawn claims.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 9, 27-28, and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (5,598,216).

Regarding claims 1 and 27, Lee discloses a network device for providing a bit stream onto a channel, comprising:

means for extracting at least one compressed domain feature point representing characteristics of the video/audio signals in a compressed domain of the video/audio signals (Fig. 11, 552);

means for performing motion estimation of the feature points extracted by the extraction means (554); and

means for tracking the feature points associated with a motion vector (Feature Point Motion Vectors) through a pre-set number of frames constructing the video-audio signals (Fig. 11, col. 8, lines 38-57).

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Regarding claims 2 and 28, Lee discloses calculating block relevance of all blocks in the current frame for determining a block having a high relevance as a candidate of the feature point selected as the next feature point based on the motion estimation means (col. 4, lines 53-67; col. 5, lines 1-5).

Regarding claims 9 and 35, Lee discloses means for calculating an estimated motion vector, the position of a reference block and a search area in a reference frame (col. 5, lines 16-34).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-8, 10-26, 29-34, and 36-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (5,598,216).

Regarding claims 3-4 and 29-30, Lee discloses MC for a prediction coded macroblock (Fig. 11, 556).

Furthermore, the Examiner takes official notice that a conventional decoder applying IDCT processing is well known in the art for decoding compressed video image frames.

Therefore, it would have been considered an obvious design choice to a person of ordinary skill in the relevant art to apply inverse transform of transforming the compressed domain to only for the blocks of high relevance selected by the metric calculation means as an efficient way to estimate motion.

Regarding claims 5 and 31, Lee discloses VOP (Figs. 5A and 5B).

Regarding claims 6-8 and 32-34, Lee discloses calculating a block signature for the current block of high relevance as selected in a pixel domain (col. 4, lines 63-67;

col. 5, lines 1-5).

Furthermore, the Examiner takes official notice that a conventional encoder performing DCT operation is conventionally well known in the art for encoding video image frames.

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art to calculate a block signature for the current block of high relevance as selected using part or all of DCT coefficients on a block as an efficient way to estimate motion.

Regarding claims 10-11 and 36-37, the Examiner takes official notice that a conventional decoder applying IDCT processing is well known in the art for decoding compressed video image frames.

Therefore, it would have been considered an obvious design choice to a person of ordinary skill in the relevant art to apply inverse transform of transforming the compressed domain to all blocks in an intra-macroblock in a search area of a reference frame as an efficient way to estimate motion.

Regarding claims 12 and 38, Lee discloses MC on all blocks in a prediction coded macroblock (Fig. 11, 556).

Regarding claims 13 and 39, Lee discloses performing motion prediction for all search locations in the reference frame around the predicted motion vector for finding best motion vector, which has the lowest distance of the current block to the reference block in terms of SAD or MSE (col. 8, lines 43-57; col. 5, lines 10-34).

Regarding claims 14 and 40, it is well known in an encoding/decoding apparatus to utilize different blocks size such as 16 X 16 or 8 X 8.

Therefore, it would have been considered an obvious design choice to a person of ordinary skill in the relevant art to perform motion estimation with variable block sizes as an efficient way to estimate motion.

Regarding claims 15, 17, 41, and 43, Lee discloses a feature point location, a block signature, MV, and a block distance (col. 4, lines 63-67; col. 5, lines 1-53).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art to save the above features for the best block positions in a reference frame as a feature point list.

Regarding claims 16 and 42, Lee discloses performing motion prediction for all search locations in the reference frame around the predicted motion vector for finding the best motion vector, which has the lowest distance of the current block to the reference block in terms of SAD or MSE for calculating the block signature (col. 8, lines 43-57; col. 5, lines 10-34).

Furthermore, the Examiner takes official notice that a conventional encoder/decoder applying DCT/IDCT, processing is well known in the art for encoding/decoding compressed video image frames, respectively.

Therefore, it would have been considered an obvious design choice to a person of ordinary skill in the relevant art to apply motion prediction for all search locations in the reference frame around the predicted motion vector for finding the best motion vector, which has the lowest distance of the current block to the reference block in terms of SAD or MSE for calculating the block signature in the DCT domain of the block having the best motion vector position as an efficient way to estimate motion.

Regarding claims 18 and 44, Lee discloses determining MV and block signature for all relevant current blocks (col. 5, lines 10-34).

Regarding claims 19 and 45, Lee discloses MC for a prediction coded macroblock (Fig. 11, 556), and calculating MV (Fig. 2, 212) and the prediction error (Fig. 1, 115 or 102).

Furthermore, a conventional encoder encoding intra (I), predicted (P), and/or bidirectionally (B) predicted macroblock is well known in the art.

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art to calculate block relevance in the case when the current macro-block is an intra-type and the reference macroblock is a prediction coded macroblock, wherein the block relevance metric calculates relevance measure based on the motion vector and the prediction error energy for an associated block by taking into account the reference macroblock as an efficient way to estimate motion.

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Regarding claims 20 and 46, Lee discloses calculating block relevance of all blocks in the current frame for determining a block having a high relevance as a candidate of the feature point selected as the next feature point based on the motion estimation means (col. 4, lines 53-67; col. 5, lines 1-5).

Therefore, it would have been considered an obvious design choice to a person of ordinary skill in the relevant art to set the block relevance to zero in the case when the current macro-block is prediction-type macroblock and updating the list of already tracked feature points from the reference frame as an efficient way to estimate motion.

Regarding claims 21 and 47, Lee discloses MC for a prediction coded macroblock (Fig. 11, 556).

Furthermore, the Examiner takes official notice that a conventional encoder/decoder applying DCT, processing is well known in the art for encoding compressed video image frames.

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art to calculate block relevance in the case when the current macro-block is an intra-type and the reference macroblock is also intra macroblock, wherein the block relevance metric calculates relevance measure based on the DCT activity from a block in the current macroblock and on the DCT activity as found by taking into account the reference macroblock as an efficient way to estimate motion.

Regarding claims 22 and 48, video compression standard such as MPEG, H.261, and/or H.263 are conventionally known in the art.

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art to utilize MPEG, H.261, and/or H.263 for encoding video image frames.

Regarding claims 23-26 and 49-52, since Lee discloses extracting feature points along with metadata associated with these feature points (Fig. 11, col. 8, lines 38-57), it would have been considered an obvious design choice to utilize the above concept for object motion estimation, a motion activity model for video, and/or estimating camera motion, wherein the estimated camera motion is used to facilitate a transcoding process between one compressed video representation into an other compressed video representation.

Conclusion

6. The prior art made of record is considered pertinent to applicant's disclosure.

A) Lee (5,668,608), Motion vector estimation method and apparatus for use in an image signal encoding system.

B) Lee (5,668,600), Method and apparatus for encoding and decoding a video signal using feature point based motion estimation.

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Shawn S An whose telephone number is 571-272-7324.

8. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SHAWN AN
PRIMARY EXAMINER

7/26/05